2012

Academy of Marketing

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[HOW MUCH DO SIMULATION GAMES IMPROVE MARKETING STUDENTS' NUMERACY AND FINANCIAL SKILLS?]

Contents

0. Summary

The work has been completed as planned and within budget. Both award holders have changed jobs during the period of the project: Lynn Vos is now Discipline Lead for Marketing at the Higher Education Academy (lynn.vos@heacademy.ac.uk) and Ross Brennan is now Reader in Marketing at the University of Hertfordshire (d.r.brennan@herts.ac.uk). Both formerly worked at Middlesex University.

The project was carried out according to the timetable set out in the proposal document. Data collection was completed according to plan, including two rounds of questionnaires and two rounds of qualitative interviews. A competitive paper was presented on the Marketing Education track at the Academy of Marketing conference 2012. The dissemination of the results of the project continues as planned. A refereed journal article is being prepared for submission, the work will be presented at an Academy of Marketing teaching & learning workshop in autumn 2012, and the results will be publicised further through the online channels of the Academy of Marketing and the Higher Education Academy. Expenditure has been within budget. The expenditure items are as specified in the proposal.

In the empirical study it was found that both quantitative and financial skills of final year marketing undergraduates increased substantially following their participation in a marketing simulation game requiring the use of numerical and financial analysis. However, the students' self-efficacy with respect to quantitative and financial tasks *declined* from the pre-game measurement to the post-game measurement. The decline was marginally statistically significant (at the 10% level, not the 5% level). One explanation for this decline may be that the post-game responses were more *realistic*, and that the simulation game provided an environment in which unrealistic views about self-efficacy were confronted with the simulated real-world difficulties of handling complex data.

1. Introduction

There is considerable evidence that, in order to enhance their employability, marketing graduates need to be capable of handling numerical and financial concepts (Walker, et al., 2009; Wellman, 2010). This is particularly important because marketers are increasingly being asked to demonstrate the return on marketing investments, and to do this they must have a facility with marketing metrics—something that involves both numerical and financial concepts (Saber & Foster, 2011). However, there is also evidence that many marketing students fail to acquire these essential skills during their undergraduate studies. For example, Ganesh et al (2010: 48) say, "At a major public university in the southwest United States, marketing faculty experienced the same frustrations as their colleagues elsewhere—that is, undergraduate students' inability to handle even basic marketing math." A number of researchers have suggested learning approaches designed to bridge this gap. However, there is no suggestion yet that the solution has been found. Indeed, it is likely that multiple strategies will be required to enhance marketing students' quantitative and financial skills. The suggestion of this paper is that one fruitful strategy for enhancing these skills is to use a strategic marketing simulation game as a medium through which financial and numerical learning is achieved.

In an increasingly competitive global market-place for higher education, universities everywhere are coming under increasing pressure to prepare their students for employment. Not to put too fine a point on it, employers are unimpressed by business school graduates who cannot do basic business calculations or do not understand elementary financial concepts such as gross and net profit margin. If this was not reason enough for marketing educators to want to endow their students with numerical and financial skills, there is also the professional pride in producing graduates who can correctly apply numerical and financial analytical skills to marketing problems. Simply, this is something that marketing educators know that their students should be able to do and, as Ganesh and colleagues (2010) observe, it is a matter of real frustration if they cannot.

The underlying rationale for the proposition that a marketing simulation game is a good medium for learning about quantitative and financial concepts is based on the arguments, firstly, that a simulation game is an engaging learning experience within which students become absorbed, and, secondly, that business and marketing students will find it easier to acquire numerical and financial concepts when these are contextualised in a simulated real-world experience. The next section expands on this rationale and provides support from the literature on marketing and business education. Subsequently, the proposition is converted into testable hypotheses, and a research study employing a pseudo-experimental design conducted at a university business school in London is described. Following the presentation of the results from this study, the paper concludes by summarising the implications for marketing educators, and mentioning a number of interesting areas for further research.

2. Employability, skills & simulation games

There is a clear consensus among marketing educators that they should strive to provide students with an educational experience that prepares them for successful careers (Ardley & Taylor, 2010; Walker, et al., 2009; Wellman, 2010). Their education cannot simply involve the acquisition of a body of knowledge; it must also make them more employable by endowing them with work-relevant skills and competences (Gibson-Sweet, Brennan, Foy, Lynch, & Rudolph, 2010; Pefanis Schlee & Harich, 2010). In particular, marketing graduates need adequate numeracy skills because marketers are increasingly called upon to be accountable for their decisions (Ganesh, et al., 2010; Saber & Foster, 2011). The premise of this study is that marketing simulation games provide an excellent

opportunity to improve these skills; consequently, we hypothesize that simulation games are a good medium through which to deliver numerical and financial skills on a marketing degree programme.

Numeracy skills are among the most important skills needed by graduates. Studies have confirmed the common-sense belief that having better numeracy skills is associated with better employment prospects (Bynner & Parsons, 1997). For example, Parsons and Bynner (2005: 35) found that modern jobs to which young people are attracted "place a high premium on skills to which basic numeracy is central". Many entry-level marketing positions would fall into this category. While there are many definitions of numeracy, perhaps the definition provided by Lockett (1974) is still the most useful: that a numerate employee is one who can make logical deductions, do basic arithmetic, and work with the relevant mathematical symbols, terms and formula used in the profession. These may appear to be quite basic skills and yet many studies have demonstrated that students in higher education today not only exhibit a weakness in basic arithmetic, but show a general fear of numbers and anything related to them. This does not bode well for their ability to succeed in marketing tasks involving setting budgets, interpreting numerical information on the business environment, competitors or customers, or undertaking even basic statistical analysis.

Previous research has demonstrated the ability of simulation games to engage students in the learning process while also developing a range of key skills and attitudes (Bobot, 2010; Vos & Brennan, 2010). This study makes use of a marketing simulation game currently used in a final year undergraduate marketing strategy module to determine the degree to which participation in such a game improves marketing students' skills in numerical and financial analysis, as well as their perceived self-efficacy in those skills. Pollack and Lilly (2008) have previously found an association between self-efficacy and the enjoyment that marketing students derive from learning activities, and between self-efficacy and the degree of practical application in the learning activity. Self-efficacy itself may be a valuable aspect of a student's employability: Pollack and Lilly (2008) suggest that a student with higher self-efficacy may be more employable than a similar student with equal, or even slightly superior, objective skill levels. Consequently, self-efficacy is included in this study, to explore whether participating in the engaging and practical learning environment provided by a strategic marketing simulation game enhances student self-efficacy in quantitative and financial skills.

Prior research into the educational value of simulation games suggests that they are good for developing key skills and giving participants a "valid representation of real world issues facing managers" (Wolfe & Roberts, 1993: 22) including enhanced skills in strategy formulation, analysis of multiple variables, integration of a range of marketing concepts and tools, manipulating financial concepts, problem-solving, communication and team-work (Faria, 2001, 2006; Gopinath & Sawyer, 1999; Jennings, 2002; Keys & Wolfe, 1990; Zantow, Knowlton, & Sharp, 2005). Many studies have demonstrated high correlations between statements such as the game "improved analytical skills", "improved problem solving", "helped learn concepts", and "taught fundamentals".

A number of studies have reported on classroom initiatives to try to improve marketing students' quantitative skills (Ganesh, et al., 2010; Pirog III, 2010; Saber & Foster, 2011). One of the key findings that emerges from these studies is that greater success can be achieved if the quantitative analysis is placed in an engaging and relevant context; that is to say, where marketing students do not consider themselves to be in "math class", but perceive themselves to be learning about the practice of marketing (Pollack & Lilly, 2008). Teaching quantitative skills in the abstract is less effective than teaching quantitative skills in the natural context of business decision-making. Marketing simulation games provide a naturalistic setting within which to address the kind of quantitative task that is commonly expected of marketing executives, such as understanding gross profit margin,

contribution, and relative market share. Little is known about the ability of simulation games to improve specific and relevant numeracy and financial skills of marketing students, and this project seeks to fill this gap.

3. Objectives and Research Design

The principal goals were to determine the degree to which participation in a marketing simulation game improves marketing students' objective skills in numerical and financial analysis, and how participation affected students' subjective perceptions of their numerical and financial skills.

Hypothesis 1: Marketing students' scores in a standard test of numeracy skills will rise following their participation in a simulation game that requires them to engage in numerical analysis.

Hypothesis 2: Marketing students' scores in a standard test of financial skills will rise following their participation in a simulation game that requires them to engage in financial analysis.

Hypothesis 3: Marketing students' self-efficacy in handling numerical and financial issues will improve following their participation in a simulation game that requires them to engage in numerical and financial analysis.

In addition, the research design provided the opportunity to explore whether differences existed between categories of respondents in terms of their response to the simulation game. The demographic data collected on each respondent was gender, age, ethnic origin (self-described, using the classifications from the UK Census), and qualification route into university (UK academic qualifications [A-levels], UK vocational qualification, high school qualification from an overseas school, access course and other).

The present project was a single-institution exploratory study. The university where the study was conducted is a large, public university in London drawing many of its undergraduate students from the local population, which is socially and ethnically diverse; like most metropolitan universities in the UK this university also attracts a substantial number of overseas students. The research design aimed to capture both objective and subjective data about the changes in students' numeracy and financial skills arising from participating in a marketing simulation game for three months. By objective data is meant the results of a test of analytical skills focusing on numerical and financial concepts, while by subjective data is meant the beliefs and perceptions of students concerning their self-efficacy in tackling numerical and financial problems.

The overall research design can be described as a pre- and post-test single-group quasi-experiment (Bryman, 2004; Robson, 1993). A questionnaire incorporating self-efficacy questions, numeric questions and financial questions was administered at the start of the game, and then again, three months later, at the end of the game. The game (SimBrand, for details see www.cesim.com) is a widely used strategic marketing simulation. It was incorporated into the final year marketing strategy module, with students making weekly decisions as part of the normal teaching and learning process. Weekly small-group seminars were devoted to briefings about how to play SimBrand, the relationship between SimBrand and strategic marketing theory, and tutor guidance on the appropriate methods of analysis and decision-making to deploy in the game. Students playing the game were organised into groups of four, which is a group size that has been recommended for experiential

learning exercises (Strong & Anderson, 1990). However, the questionnaire was administered to individuals under controlled, test-like conditions.

With the aim of achieving high reliability between the two administrations of the questionnaire, exactly the same research instrument was used at the start and at the end of the game. This approach carries a small risk that, at the time of the second administration, some respondents may recollect questions from the first administration. However, the risk here was considered minimal because, firstly, three months elapsed between administrations, secondly, all questionnaires were collected after the first administration, and, thirdly, no feedback was provided to students until after the second questionnaire administration.

Administration of the research instrument was confidential but not anonymous. Since the students were to receive feedback on their performance in the tests incorporated into the questionnaire once the study had been completed, as a form of constructive feedback, it was necessary to record respondents' student identification numbers. In addition, since the research objectives require the comparative analysis of the results from the first (before) and second (after) measurements, it was necessary to have a mechanism for pairing-up the responses; the student identification number was used for this. The questionnaire was administered in class as a part of the normal business of running the module. The research process was integrated into the teaching and learning strategy for the module; providing feedback to students on their results on the questionnaire tests (that is, how their self-efficacy, quantitative skills and financial skills had changed during the module) was part of the formative assessment for the module.

3.1 Research Instrument Design

Self-efficacy in numerical and financial tasks had to be captured by the research instrument. It has been emphasised in prior research that the measurement of self-efficacy must be domain specific (Bandura, 1977, 1997; Pajares, 1996), consequently the decision was made not to use general questions that have been previously developed to measure mathematics self-efficacy, but to develop an original scale for this study. Questions previously used to measure general mathematics self-efficacy concentrate on aspects of pure mathematics (Betz & Hackett, 1983), while the questions developed for this study concentrated on specific quantitative and financial applications in marketing.

The questionnaire comprised four sub-sections. The first asked for basic demographic data: gender, age, ethnicity and prior educational qualifications. The second sub-section focused on student self-efficacy perceptions regarding quantitative and financial analysis for marketing decision-making. Respondents were asked to examine a one-page sales report drawn from a case study in a strategic marketing textbook. Five calculations or tasks were described for this sales report, representing quantitative thinking activities that would commonly be associated with marketing analysis (for example, to calculate the sales generated for every £1 of advertising spent). The respondents were asked to indicate the level of confidence they felt that they would be able to undertake these tasks correctly. An eight-point confidence scale, drawn from Pajares & Graham (1999), was used anchored by "Not confident at all" (1) and "Completely confident" (8). The five questions and eight-point scale gave a self-efficacy score of between 5 and 40 for each respondent.

The third sub-section of the questionnaire comprised 10 quantitative test questions, each with a unique correct answer. Respondents had to answer these questions without the use of a calculator. Eleven of the questions required mental arithmetic. These questions were calibrated to be at the level expected of a typical English school leaver; specifically, the easier questions were designed to match

the foundation and higher-tier levels of the English General Certificate of Secondary Education in mathematics (non-calculator paper), while harder questions slightly exceeded this level. The fourth sub-section of the questionnaire comprised five questions concerning concepts in financial accounting, based on a simple profit and loss statement drawn from an introductory marketing textbook. Following the administration of the questionnaire, the researchers coded the quantitative and financial questions manually and gave each respondent a score between 0 and 15. The questionnaire is included as an appendix.

4. Results and Discussion

Table 1: Respondent Characteristics

Characteristic	Category	N	%
Gender	Male	33	43.4
	Female	43	56.6
Ethnicity	White	27	35.5
	Asian or Asian British	22	28.9
	Black or Black British	13	17.1
	Other	14	18.5
Prior qualification	A levels	29	38.2
	UK vocational qualification	22	28.9
	High school in another country	19	25.0
	Other	6	7.9

Table 1 provides background information about the respondents. There were 127 respondents before game participation and 88 respondents after game participation; of these, it was possible to identify 76 paired questionnaires, where the same respondent had completed both the before and the after questionnaire. In Table 1, and in the following analysis, it is only the results from those 76 respondents, for whom a direct paired comparison is possible, that is discussed. The profile of respondents shown in Table 1 is representative of a 'modern university' in London or most other British metropolitan areas (a 'modern university' is one that has been awarded university status since 1992). Such universities have an ethnically diverse student body and attract many students with vocational qualifications as well as those with A levels.

Table 2: Mean Scores Before and After Participation in the Simulation Game

(N=76)	Mean self-efficacy (out of 40)	Mean quantitative score (out of 10)	Mean financial score (out of 5)
Before	24.10	4.30	0.14
After	22.51	7.17	0.78
Difference	-1.50	2.87	0.64
t value	1.898	9.757	4.729
Significance level	0.062	0.000	0.000

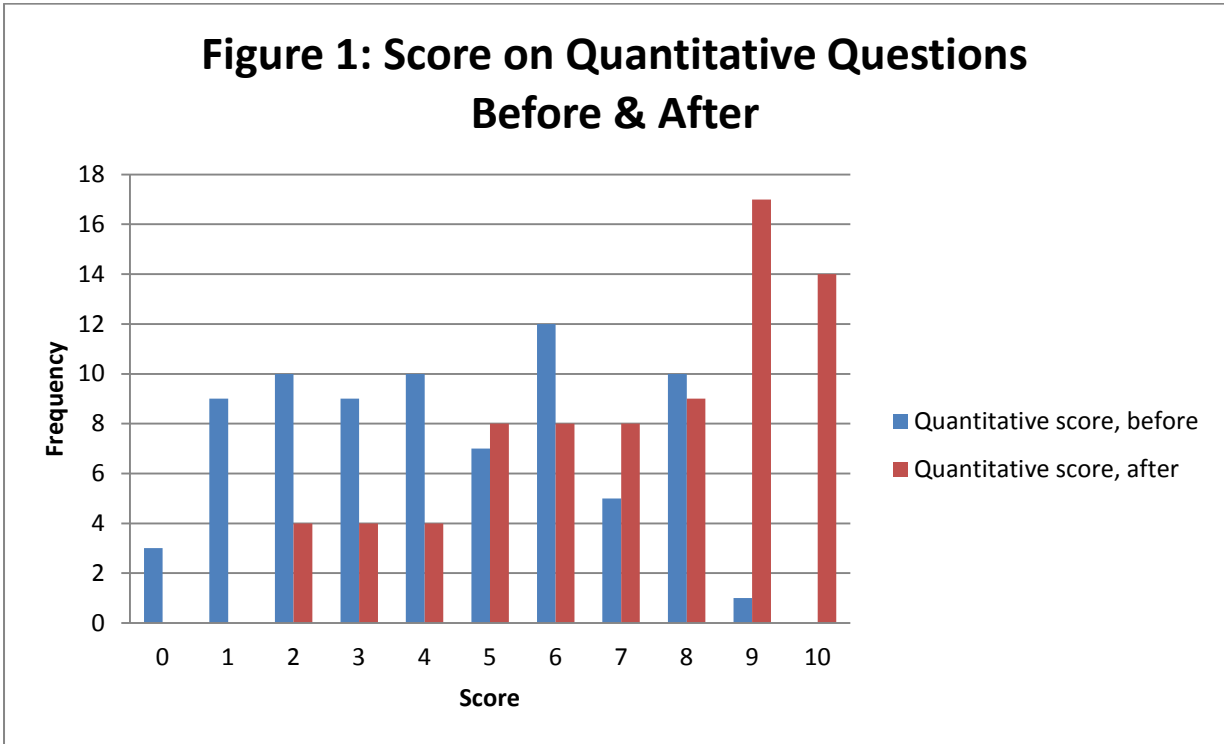**Figure 1: Score on Quantitative Questions Before & After**

Table 2 provides mean scores on the three measures (self-efficacy, quantitative skills and financial skills) before and after participation in the simulation game. Figure 1 provides greater detail for the quantitative skills measure. There was a substantial increase in mean scores on the quantitative and financial skills measures after participation in the game. For the quantitative measure, Figure 1 shows that before participation 22 students scored 0, 1 or 2 out of 10 on this measure, while after participation no student scored less than 2, and only four students scored as low as 2. The mean score on the quantitative component increased from 4.30 (before) to 7.17 (after) out of a possible 10, and the mean score on the financial component increased from 0.14 (before) to 0.78 (after) out of a possible five. On the other hand, unexpectedly, mean student self-efficacy was lower after the game than before, declining from 24.10 (before) to 22.51 (after) out of 40. In terms of the research hypotheses, we have the following results:

ACCEPT H1: Marketing students' scores in a standard test of numeracy skills will rise following their participation in a simulation game that requires them to engage in numerical analysis.

ACCEPT H2: Marketing students' scores in a standard test of financial skills will rise following their participation in a simulation game that requires them to engage in financial analysis.

REJECT H3: Marketing students' self-efficacy in handling numerical and financial issues will improve following their participation in a simulation game that requires them to engage in numerical and financial analysis.

Where, as here, a pseudo-experiment is conducted without a control group, some care has to be taken in the interpretation of the results, since confounding factors might be responsible for observed changes. In the present case these risks are considered to be fairly low. The students were not studying any other parallel modules that covered quantitative and financial analysis, and the average age of the respondents was 21.7 years, so that *maturation* of the respondents during the experimental

period can be ruled out (maturation would be a more likely confounding factor with very young children, for example). Given that the observed changes are substantial and widely observed within the respondent group (85.5% of respondents recorded an improvement on their quantitative score) it is plausible to attribute much of the change to the experimental intervention, that is, the effect of tutor-supported participation in the simulation game.

The result for mean self-efficacy was unexpected. Mean self-efficacy for quantitative and financial tasks was expected to increase as the students learned about the application of these concepts in the practical context of the game, and became more confident in their use. In fact, a decline was measured in mean self-efficacy, although it is not quite significant at the 5% level. It is possible that, prior to their practical engagement with the application of quantitative and financial concepts the respondents simply assumed that, as final year undergraduates on a marketing course, they would be fairly competent in these tasks (moderately high self-efficacy). Subsequently, on finding that the interpretation of the game information was complex and often confusing, they may have revised their self-efficacy beliefs downwards. However, this interpretation cannot be directly supported from the study data.

The principal goal of the study was to test for the effects of participation in the simulation game on students' self-efficacy and objective ability with respect to the kinds of elementary numerical and financial analysis typically found in marketing management. However, the study design also makes it possible to investigate whether there are significant differences between categories of student, either in terms of their performance on the tests, or in terms of the changes in performance from the first questionnaire administration to the second questionnaire administration. The demographic data collected for this purpose were sex, age, ethnicity, and university entry qualification type. No statistical association was found between age or student ethnicity and any of the dependent variables (self-efficacy, and scores on the financial and quantitative tests). While there were no significant differences between the absolute scores of men and women, there was some evidence that women achieved a larger increase in their quantitative test score than men. The improvement in mean quantitative test score for men was 2.18, and for women 3.39 (t value 2.15, significance level 0.035).

The picture concerning university entry qualification is a little more complicated, and is illustrated in Table 3. Students with overseas qualifications had higher average self-efficacy and higher average test scores than students with UK qualifications, while students with the traditional, academic qualification (A levels) had higher average self-efficacy and higher test scores than students with UK vocational qualifications. In general, each of these three groups of students showed similar levels of decline in self-efficacy and improvement in test scores between the first and second questionnaire administrations. The one anomaly is that the average score for students with UK vocational qualifications on the financial test showed the largest increase. However, the between-group differences shown in Table 3, although interesting, are largely not statistically significant. From Table 3 it can be concluded that differences in prior educational experience, for which entry qualifications are a proxy, may be a relevant factor affecting student response to the simulation game. Further research would be needed to establish whether these results can be replicated.

Table 3: Before and After Scores for Students with Different Entry Qualifications

Category	Measure	Mean self-efficacy (/40)	Mean quantitative score (/10)	Mean financial score (/5)
High school in another country (N=19)	Before	27.68	4.53	0.16
	After	25.21	7.63	0.79
	Difference	-2.47	3.10	0.63
	% Change	-8.9%	68.4%	393.8%
A levels (N=29)	Before	23.10	4.17	0.10
	After	21.17	6.90	0.59
	Difference	-1.93	2.73	0.49
	% Change	-8.4%	65.5%	490.0%
UK vocational qualification (N=22)	Before	22.00	4.18	0.09
	After	21.10	6.86	0.91
	Difference	-0.9	2.68	0.82
	% Change	-4.1%	64.1%	911.1%

Table 4: Correlations between Score Variables

	Self-efficacy Before	Self-efficacy After	Quantitative Score Before	Quantitative Score After	Financial Score Before	Financial Score After
Self-efficacy Before						
Self-efficacy After	0.60[**]					
Quantitative Score Before	0.38[**]	0.28				
Quantitative Score After	0.13	0.35[**]	0.45[**]			
Financial Score Before	0.17	0.11	-0.17	0.14		
Financial Score After	0.20	0.20	0.24[*]	0.32[**]	0.18	

Table 4 shows the correlations between the test scores for each component—self-efficacy, quantitative score, and score on financial questions—before and after test administration. The correlation coefficient between before and after self-efficacy scores is high (0.6) and significant at the 1% level. In addition, there is evidence of relatively high correlations between self-efficacy and performance, something that is characteristic of self-efficacy studies (Bandura, 1997). The self-efficacy before and after scores have moderately high, and significant (at the 1% level), correlation coefficients with the quantitative before and after scores. Self-efficacy is usually correlated with

performance, both because those with greater objective competence tend to have higher self-efficacy, and because greater self-efficacy leads to increased persistence with a task. In the case of the present study, it is likely that both effects were present: students with stronger quantitative skills would have above-average self-efficacy, and even students with average or below quantitative skills would persist longer with the tests if they had relatively high self-efficacy. The nature of the questions asked—elementary quantitative and financial questions—was such that greater persistence would likely bring greater success. One observation, when administering the questionnaire, was that in the case of a few students their self-efficacy concerning quantitative and financial skills was so low that they refused even to attempt those parts of the questionnaire the first time it was administered. That is, they gave up before they started, and refused to make any attempt at all. If such students had slightly greater self-efficacy then it is very likely that would have found it possible to complete at least some of the test questions.

5. Limitations, conclusions, and insights for marketing educators

There are limitations on the external validity of this study. This was a single-institution study on a relatively small scale. The pre- and post-test quasi-experimental design (without control group) is convenient to administer, but leaves open the possibility that confounding factors outside the researchers' control may have affected the measurements. In addition, this study only took two snapshots at the beginning and end of the simulation game. A very important question that remains is the durability of the learning achieved by the students. Of course, many of the skills that they used during the simulation game were skills that they had previously been taught on an elementary quantitative methods module and a financial accounting module—typically first year undergraduate modules. A question for future research is whether learning that is achieved through an engaging, experiential learning process (such as a simulation game) is more, less, or equally durable as learning achieved through more didactic approaches.

On the first administration of the test instrument the final year students on this strategic marketing module had fairly poor skills in the quantitative analysis of marketing data and in elementary financial analysis, corroborating the pessimistic remarks of Ganesh et al (2010) about the analytical skills of marketing students. Objective performance was positively correlated with self-efficacy in numerical and financial tasks. There was some evidence that performance in such tasks is associated with prior qualifications; students who matriculated from overseas high schools seemed to out-perform those with UK qualifications. By the time of the second administration the average scores on the quantitative component had increased from 4.30 (out of 10) to 7.17 and the average scores on the financial analysis component had increased from 0.14 (out of 5) to 0.78, while the average self-efficacy score had declined from 24.01 (out of 40) to 22.51. The outcome on quantitative skills accords fairly closely to what the authors expected—final year marketing students are a little rusty in terms of elementary marketing math calculations, but were able to improve quickly when faced with an engaging (and competitive) challenge requiring the use of number. The outcome on elementary financial skills came as a surprise to the authors. While the students' performance improved considerable, it did so from an unexpectedly low base, and even after the improvement the mean score achieved was less than one correct answer out of five. As readers can see in the appendix (questions 20 to 24) these were not difficult questions. It is very unlikely that this phenomenon is unique to the university or the class investigated in this study; it is more likely that this is not unrepresentative of final year marketing undergraduates, all of whom have, at some point in their degree, taken a module in financial accounting. It seems to the authors that this finding is worthy of further investigation, and that if it is found to be generalisable, then marketing educators need to

identify urgently strategies to improve the financial literacy of their graduates. If marketers are to understand and act upon marketing metrics, they first need basic competence in marketing math and the interpretation of elementary financial information.

The findings from this study are perhaps of greatest use to marketing educators who are already users of simulation games, or to those who are seriously considering using a simulation game. It would probably be undesirable to undertake the considerable task of integrating a simulation game into the marketing curriculum purely because it could help in delivering elementary quantitative and financial skills. There are many good reasons to use simulation games, and the present study seems to have added one more good reason to that list. The curriculum design described in this paper has considerable strengths: students are introduced to quantitative methods and financial concepts early in their marketing degree course, and then this learning is reinforced towards the end of their studies through the highly practical medium of a simulation game. This serves to remind them of the concepts, permit them to re-acquire skills, and to see how these concepts and skills are put to use in the work-place. The ideas presented here may encourage those marketing educators who are already using simulation games to address more explicitly quantitative and financial analysis within the game environment.

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Appendix: Marketing Student Quantitative Skills Questionnaire

We hope that your experience on our module will help you to understand how marketing and financial data are used to make business decisions. This is the first of two questionnaires we will be administering during the module. We have two reasons for doing this. First, we want to get an idea of how comfortable you are with the sorts of analyses we will be doing in the module; and second, we want to use this opportunity to check your answers and give you feedback. That's why we ask for your student number—but don't worry; the only people who will see your questionnaire are you and ourselves as module tutors.

Please write in your student number

M							

1   Your gender (please tick one)

Male		1
Female		2

2   Your age (please write in)

	Years

3   Your ethnic background (Please tick one)

White		1	Black or Black British		4
Mixed		2	Chinese		5
Asian or Asian British		3	Other		6

4   Which type of qualification did you use to get a place on your MUBS programme?
(Please tick one only)

A levels		1
Vocational qualification [e.g. BTEC]		2
Access course		3
High school in another country		4
Other		5

Please look at Table 1. This shows the sales report for a product called the CPC100 photocopier. Suppose you were asked to do the following calculations or tasks. Please indicate how confident you are that you would be able to do each correctly.

The confidence scale runs from (1) meaning "not confident at all" to (8) meaning "completely confident". Tick the number that matches your own feeling of confidence for the task.

5   Calculate the share of marketing expenditure that was spent on market research in April

Not confident at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	Completely confident (8)

6   Prepare a revised forecast for sales volume for the period July to December, taking account of the actual data for January to June

Not confident at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	Completely confident (8)

7   Calculate the variance (in £ and in %) between forecast and actual advertising spend in July, if the actual spend was £27,650

Not confident at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	Completely confident (8)

8   Prepare, from a blank spreadsheet, a similar spreadsheet to Table 1, showing all the same components shown in Table 1, but for a different product.

Not confident at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	Completely confident (8)

9   Calculate the sales revenue generated per £1 of advertising expenditure for each month and for the year-to-date

Not confident at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	Completely confident (8)

Please answer Questions 10-19, using the information in the next two paragraphs.
You recently joined a company that markets portable DVD players, as a Graduate Marketing Trainee. Today you attended a meeting where the Sales Director discussed the most recent sales figures. Read what the Sales Director said, and then answer the questions below:

"Our sales forecast for last month was £235,000, but actual sales exceeded that figure by £26,000. Our recommended retail price is £90 per unit, but we have noticed quite a lot of price discounting. For example, the online retailer *TVs Direct* is selling our DVD player at a 20% discount on the recommended price. At the recommended price of £90 the retailer makes a gross profit margin of £30. Our market research company has suggested that we should increase the recommended retail price to £100, but I'm worried that would make us uncompetitive."

	Question	Your answer	For office use	
10	At what price is *TVs Direct* selling the DVD player?		1	2
11	What percentage increase in recommended retail price is the market research company suggesting?		1	2
12	What gross profit margin (in pounds) is *TVs Direct* making on each DVD player?		1	2
13	What actual sales did your company achieve last month?		1	2
14	What percentage gross profit margin does a retailer make if they sell your DVD player at the recommended retail price of £90?		1	2

At the interview for the job of Graduate Management Trainee you were asked to sit a short test. Answer the following questions from the test.

	Question	Your answer	For office use	
15	In 2010 our sales revenue was £2.4 million. This year we are forecasting sales to be 12% higher – calculate a forecast for this year's sales.		1	2
16	In 2010 our share of the total UK market was 17%. Provide an estimate of the overall size of the UK market (you do not need to calculate this exactly, we are looking for a good approximation).		1	2
17	Our gross profit per unit is £20. The overhead costs of running the business are £400,000. At what sales volume do we start to generate a net profit? (To say the same thing in different words: What is our break-even sales volume?)		1	2

	Question	For office use	
18	In 2010 our sales revenue was £2.4 million, our variable costs were £1.0 million, and our overhead costs were £400,000. Calculate our total net profit for 2010.	1	2
19	What fraction of £2.4 million is £400,000?	1	2

Please answer the following questions based on Table 2.

	Question	For office use	
20	Briefly explain how you would calculate the gross profit percentage for Charles Smith Menswear	1	2
	Your answer		
21	Briefly explain how you would calculate the average inventory (at cost) held by Charles Smith Menswear	1	2
	Your answer		
22	Given that Charles Smith Menswear has a total investment of £150,000 explain how you would calculate the company's return on investment (ROI)?	1	2
	Your answer		
23	Suppose that 'purchase discounts' were £28,000 rather than £15,000; what would the figure for 'gross margin' be?	1	2
	Your answer		
24	What net profit percentage did Charles Smith Menswear achieve?	1	2
	Your answer		